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(58) Field of Search

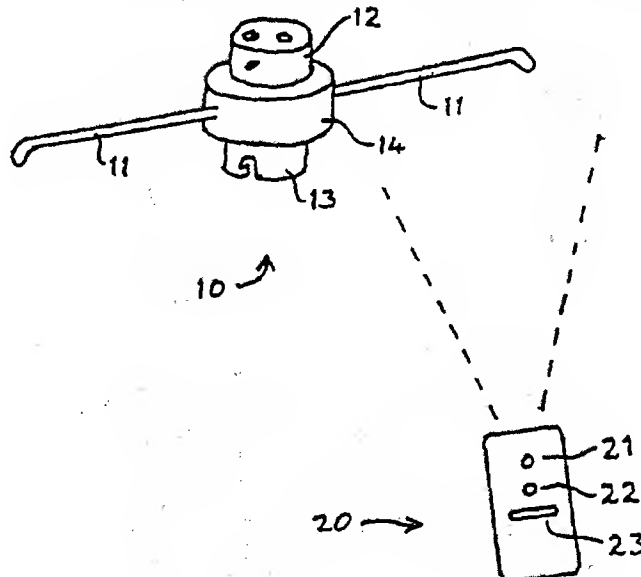
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(54) Abstract Title

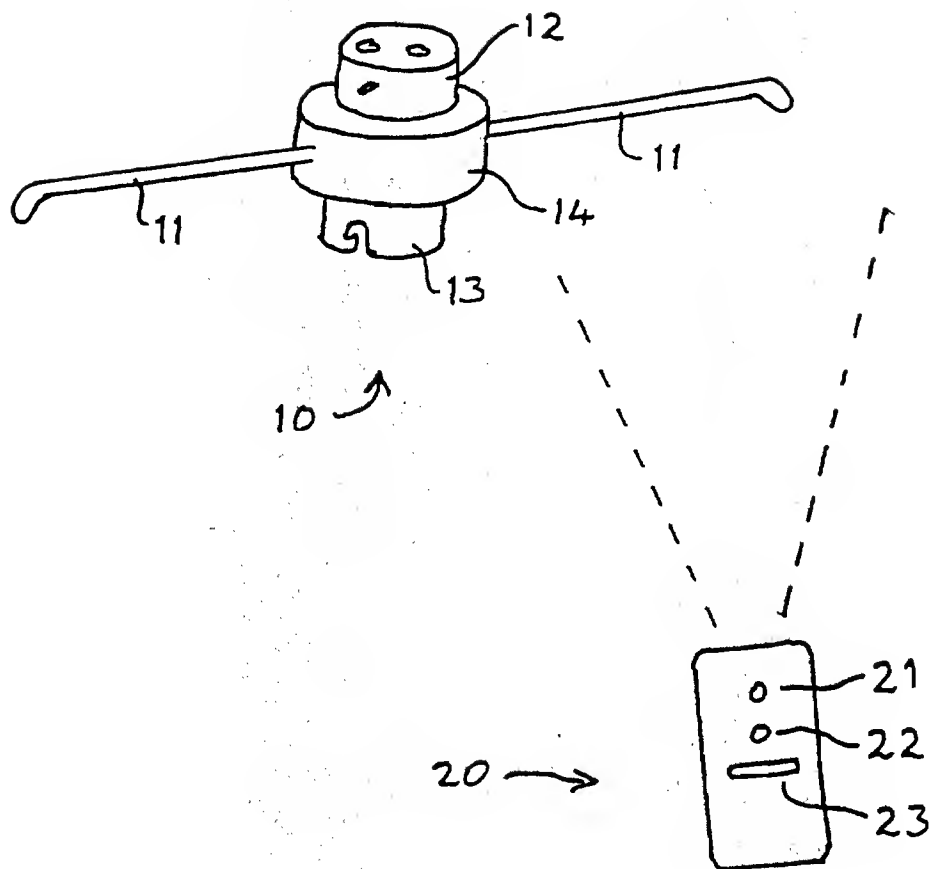
Lighting control system

(57) A lighting control system comprising a control unit 20 which transmits instructions to operate a light, and a receiver unit 10 responsive to the signals from the control unit and placed in series with the light. The control unit will usually be a hand held device with a switch or control panel to allow operation. The receiver unit is installed between a light bulb and the electrical contacts which deliver the power. The need for switches and their wiring is thus eliminated, or, if switches are retained, greater flexibility in the control of lights results. The system may provide dimmer control, and/or control of a plurality of lights, using different identification signals. Means for detecting removal of a control system from the building may be provided.



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Lighting Control System

This invention relates to a light control system, that is a system that allows electric lights to be turned on and off.

Most domestic lights are operated by a switch located on a wall. The light is usually attached to the wall or ceiling, and the switch is normally located next to a door (usually inside the room, though occasionally outside). The circuit supplying electricity to the light must therefore be routed via the switch. Lights needing two or more switches, such as stair lights, require extra circuitry and wiring so that either switch can operate the light independently.

When adding a new light, or another switch for an existing light, much work has to be done to install new cables in the wall between the power supply and the switch, and the switch and the light. Conduiting the cable over the surface of the wall is unsightly, while burying the cable in the wall means that the wall surface will then have to be redecorated.

The general object of present invention is to provide an improved system for installing and operating lights.

Accordingly the present invention provides a lighting control system comprising a control unit which transmits instructions to operate a light, and a receiver unit responsive to the signals from the control unit and placed in series with the light.

The control unit will usually be a hand held device with a switch or control panel to allow operation. A transmitter is included in the control unit to convey instructions to the receiver. The receiver unit is installed between a light bulb and the electrical contacts which deliver the power. It contains in it or extending from it an antenna and receiver to pick up the control unit's signals.

In this way the need for switches and their wiring is eliminated. Even where switches are retained, the system gives greater flexibility in the control of lights.

A light control system embodying the invention will now be described, by way of example, with reference to the drawing, which is a diagrammatic view of the system.

Referring to the drawing, the receiver unit 10 consists of a receiving antenna 11 and a plug and socket connector. The plug portion 12 of the connector is placed in a conventional light fitting socket, while a standard light bulb is placed in the socket portion 13 of the connector. The plug and socket may be either of the bayonet type, as shown here, the screw-thread type, or of a type corresponding to other bulb locking mechanisms.

The receiver unit shown in Fig. 1 is primarily intended for use with an existing light fitting socket; that unit can be inserted into the existing socket without requiring any rewiring. For original installation, the receiver unit would normally be formed as a complete bulb socket to which the supply cable or flex would be attached in the usual way (ie by connecting the individual wires of the cable to connector terminals in the device under a protective cover). A further option is to incorporate the receiver in the base of the light bulb itself; for this, the light bulb would normally be a fluorescent device rather than an incandescent device.

The receiving antenna 11 may be located in or around the receiver unit, or, as shown here, extend out beyond the light bulb. This will depend on the method of remote signalling, and the type of lamp shade or covering. The antenna could, if necessary, be fashioned into some pleasing form to disguise its purpose. (Similarly, the control unit may be given a fancy shape.)

The control unit 20 comprises a body which contains the batteries, transmitter device and the necessary circuitry to code the operation of the control panel's buttons into signals emitted from the transmitter device. The transmitter may operate by infra-red, ultrasound, microwave or radio signals, or any other convenient remote signalling means.

The receiving antenna is of a type compatible with receiving the control unit's signals, and the body 14 of the receiver unit 10 also contains the appropriate circuitry necessary to decode the signals into operations on the light bulb's power supply. This circuitry is of course permanently powered from the power supply into which the receiver unit is plugged.

In the simplest instance, the control unit would be capable of turning the light on and off — only a single button 21 would be required to change the light's state. A control element 22 can also be included for dimming and brightening the light (provided, of course, that the light is of a type capable of being so controlled); for this, the receiver unit will of course have to include suitable dimmer circuitry.

A further option is to provide the control unit with narrow and broad beams, one controlled the button 21 and the other by a further button 23. The user can then use the normal button 21 to control a light by pointing the control unit at that light, or can use the second button to control all lights within range of the unit. Both buttons may be "on/off" buttons, or the second button may be an "on only" (or even "off only") button. This option will typically be used to allow someone entering an area to turn on all lights within range, and then control them individually. Instead of providing a second button 23, the receiver unit may be arranged to produce a narrow beam in response to a gentle press on button 21 and a broad beam in response to a hard push on that same button.

The system may be expanded to allow the control of different lights by including an identification signal before the operation signal, each receiver unit having its own identification code; a function to turn all the lights on or off at once may also be included. Provided the transmitter is sufficiently directional, different lights could be operated by aiming the control unit at them.

As discussed above, a major advantage of the system is that it enables lights to be controlled without switches and their associated cabling having to be installed. If a light is readily accessible, eg a free-standing floor light, the switch can of course be installed directly in the cable or flex power supply to the light. But the present system can of course be applied also to such lights, enabling them to be controlled from remote positions; in effect, it allows the switches for such lights to be positioned away from the lights themselves.

The control unit could be incorporated into other general purpose electrical remote control units, or for use in conjunction with personal computers. The control unit can be equipped with a hook to be hung near an existing light switch or other convenient location. To prevent it becoming lost, it can be permanently attached to the wall by a tether. Alternatively, the control unit

could be attached to the wall as a permanent fixture, like a normal switch, but without of course requiring any special wiring to it. If a power source is available nearby, the control unit can be powered from it, either permanently or via a charging unit which charges a battery in the control unit and allows the unit to be removed temporarily.

Obviously, a single system can incorporate several control units, which need not all have the same capabilities. Thus a small basic control unit might be carried on a car key ring with a more elaborate unit normally being kept inside the house.

In industrial situations, the control unit could incorporate means which operate in conjunction with sensing means installed eg at all outside doors to produce an alarm signal if the control unit is taken through a door and so out of the building. The alarm signal could be produced by the sensing means and/or the control unit.

Claims

- 1 A lighting control system comprising a control unit which transmits instructions to operate a light, and a receiver unit responsive to the signals from the control unit and placed in series with the light.
- 2 A lighting control system according to claim 1 comprising a hand held device with a switch or control panel to allow operation.
- 3 A lighting control system according to either previous claim wherein the receiver unit is installed between a light bulb and the electrical contacts which deliver the power.
- 4 A lighting control system according to any previous claim wherein the receiver unit has extending from it an antenna to pick up the control unit's signals.
- 5 A lighting control system according to any previous claim wherein the control unit includes means for generating a dimming signal and the receiver unit includes dimmer circuitry.
- 6 A lighting control system according to any previous claim wherein the control unit can produce narrow and broad beams.
- 7 A lighting control system according to any previous claim including a plurality of receiver units, and wherein the control unit can produce instructions including identification signals, the different receiver units being responsive to different identification signals.
- 8 A lighting system according to any previous claim including a plurality of control units.
- 9 A lighting system according to any previous claim including, at each door or the like of a building, boundary defining means which interact with a control unit in its vicinity such that an alarm signal is generated by the boundary defining means means and/or the control unit.

10 A lighting control system substantially as herein described.

11 Any novel and inventive feature or combination of features specifically disclosed herein within the meaning of Article 4H of the International Convention (Paris Convention).



Application No: GB 9809682.9
Claims searched: 1-10

Examiner: Mike Davis
Date of search: 29 July 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): G4H (HRCE, HRCM, HRCS)

Int Cl (Ed.6): H05B

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Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2292626 A (COLEMAN ET AL)	1 at least
X	GB 2284287 A (MASON)	"
X	GB 2280291 A (WEINER ET AL)	"
X	GB 2174222 A (PHILLIPS)	"
X,P	EP 0773708 A1 (MAGNETEK)	"
X	EP 0255580 A2 (QUESTA)	"
X,P	WO 97/24908 A1 (REGAN ET AL)	"
X	WO 92/01968 A1 (LEON ET AL)	"

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.